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JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 7 December, 1905 No. 84

NOTES ON NEW ENGLAND VIOLETS, — III.

Ezra Brainerd.

Studies of our white stemless violets for three seasons past have brought to light several interesting and important facts. The Linnean species, *Viola primulifolia* and *V. lanceolata*, seem to be, at least in the Northern States, well defined and properly understood. For many years the remaining forms of the group passed as one species under the name *V. blanda*, Willd. (1804). LeConte in 1828 was the first to separate from this aggregate his *V. amoena*; and in 1870 Dr. Gray distinguished *V. renifolia*. But it is important in this work of segregation to find out just what Willdenow had before him and described as *V. blanda*. It appears to have been a living plant sent from near Philadelphia and grown in the gardens at Berlin. It may be that a dried specimen of it was never made; at least, Dr. Robinson, who the past summer made a search for the type in the Berlin herbaria, reports that none is to be found.

But with the publication of *Viola blanda* was issued an admirable colored plate; regarding this Dr. Britton observed in a letter last May: "It looks to me as though the original figure of *V. blanda* represents what we are calling *V. Leconteana*" (*V. amoena*, LeConte). I have examined this plate both at the Herbarium of the New York Botanical Garden and at the Gray Herbarium. The hand coloring in both copies is quite the same, and represents the peduncle and petioles and even the midrib as reddish, — a good character of *V. amoena*, but one never seen in what has been passing with us as *V. blanda*. Furthermore, the outline of the leaf, its crenation, and the structure of the flower plainly indicate the first mentioned spe-

cies. Several good judges at both New York and Cambridge were asked their opinion of the species figured, and all without hesitation called it *V. Leconteana* or *V. amoena*.

Moreover, in Willdenow's description particular emphasis seems to be laid on the fact that the petals are all beardless.[1] This is strictly true of *Viola amoena*; but the lateral petals of the so-called *V. blanda* have almost always more or less of a beard. The upper petals Willdenow thus describes: "bina superiora lanceolata obtusa alba." This might answer for the long narrow upper petals, rounded at the tip, of *V. amoena*; but it is decidedly inapplicable to those of the so-called *V. blanda*, which are broadly obovate or even orbicular. Much as we may regret the necessity, the name *V. blanda* must be restored to its original application, displacing *V. amoena* and the later synonyms.

This forces us to find another name for the species that we have been wrongly calling *V. blanda*; and fortunately there is an old name of Banks's that seems to be available and not altogether infelicitous. In the Prodromus, i. 295 (1824), under Banks's manuscript name "*Viola rotundifolia*, *β. pallens*," DeCandolle describes a sheet of specimens collected by Banks in Labrador. This type is now in the Banks Herbarium at the British Museum, and was studied and photographed by Mr. Fernald in 1903. He then felt no hesitation in pronouncing the plants to be what we have been calling *V. blanda*, the smallest of our white violets. Two excellent photographs of this sheet show seven plants, each with one flower and two or three leaves, and strongly support Mr. Fernald's conviction as to the species here represented. The plant is certainly not the true *V. blanda* above discussed; and it is extremely doubtful if the latter species reaches as far to the north as Labrador. In the mountains of Vermont the traditional *V. blanda* ascends some 2000 feet higher than the true *V. blanda* (*V. amoena*).

But in this group of plants there is another though quite different source of confusion, — the presence of a distinct but heretofore unrecognized species, that in its vernal stages has commonly passed as "*V. blanda*" (Am. authors), and in its summer stages as *V. amoena*

[1] This is stated in three places: (1) "petalis imberbibus"; (2) "petalis albis omnibus interne laevibus"; (3) "a Viola cucullata, obliqua et nonnullis aliis novis speciebus Americae borealis, petalis lateralibus basi glabris nec barbatis . . . diversa."

(the *V. blanda* of Willdenow). It is indeed more nearly related to the latter than to the former, which, as will be seen in the synopsis below, is in a group radically distinct from all the other round-leaved white violets. But although the new species is allied to the *V. blanda* of Willdenow, it differs from it in having on the expanding leaves and peduncles a white, villose, often dense pubescence that mostly persists through the summer, in having bearded lateral petals, and in having its upper petals broadly obovate, instead of long, narrow, and strongly reflexed. From *V. renifolia* the new species differs in its bearded lateral petals, and in its acute leaves longer than broad, excepting the one or two that appear earliest.

Fine specimens of the four species under discussion were grown in pots through the past season, and were under frequent inspection; in foliage and in general aspect the four were all strikingly distinct. The new species is plainly northern, and grows even to the summit of the highest peaks of Western New England, such as Greylock and Equinox.

I must furthermore state, though with regret, that the three woodland species, when growing together, are disposed, like the blue violets, to produce intermediate forms. This has been a further source of confusion; but we may hope that in due time after patient study this perplexity also may be unraveled.

Synopsis of the New England Species of White Acaulescent Violets.

* Cleistogamous capsules oblong, green, subtended by linear-lanceolate sepals; seeds black, about 1 mm. long; peduncles erect or ascending. Usually in open bogs, wet meadows and on borders of brooks.

1. V. LANCEOLATA, L. Leaves narrowly lanceolate.

2. V. PRIMULIFOLIA, L. Leaves ovate, acute, with subcordate or tapering base.

3. **V. pallens** (Banks), n. comb. Leaf-blades cordate, obtuse or rarely acute, glabrous on both sides; petioles and scapes often with scattered hairs, not spotted with red; lateral petals beardless or with a few rudimentary hairs, upper petals broadly obovate. — *V. rotundifolia*, β. *pallens*, Banks in DC. Prodr. i. 295 (1824); *V. blanda* of recent American authors, not Willdenow. — Northeastern North America, from Labrador to "the mountains of South Carolina and Tennessee"[1]; and apparently westward.

[1] Pollard in Small's Flora of the Southeastern United States.

* * Cleistogamous capsules ovoid, commonly brownish purple, subtended by ovate-lanceolate sepals; seeds brown, 1.6–2 mm. long; peduncles horizontal or deflexed.— Usually in cold rich woodlands.

4. V. BLANDA, Willd. Glabrous except for minute white hairs on the upper surface of the leaves, especially the basal lobes; leaves cordate-ovate, acute or acuminate; petioles and scapes usually spotted with red; petals all beardless, the upper pair often long, narrow, and strongly reflexed, sometimes twisted; usually in flower 10–20 days later than the two following species.— Hort. Berol. t. 24 (1804); *V. amoena*, LeConte, Ann. Lyc. N. Y. ii. 144 (1828); *V. Leconteana*, G. Don, Gen. Syst. i. 324 (1831); *V. blanda*, var. *palustriformis*, Gray, Bot. Gaz. xi. 255 (1886); *V. alsophila*, Greene, Pitt. iv. 7 (1899).— Quebec to Minnesota, and south to Georgia and Alabama.

5. **V. incognita**, n. sp. Peduncles, petioles and lower surface of leaves pubescent with soft white hairs especially when young, the upper leaf-surface glabrous or nearly so; aestival leaves large, rugose, broadly cordate-ovate, acute; lateral petals bearded, upper pair obovate; flowering early. — Type in Hb. Gray from wooded slopes of Moosalamoo Mountain, Salisbury, Vermont, May 5, 1903, and August 14, 1905. — Common from eastern Quebec and Prince Edward's Island westward and southward through the mountains of northern and western New England.

6. V. RENIFOLIA, Gray. More or less pubescent, but upper surface of reniform leaves often quite glabrous; petals all beardless, the upper pair orbicular; flowering early. — Proc. Am. Acad. viii. 288 (1870); *V. Brainerdii*, Greene, Pitt. v. 89 (1902), in part.— Newfoundland to the Mackenzie River, south to New England, New York, Michigan and Minnesota.

MIDDLEBURY, VERMONT.

A NORTHERN CYNOGLOSSUM.

M. L. Fernald.

Cynoglossum virginicum L., as accepted by American botanists, is supposed to extend northward into the Maritime Provinces and southward to Florida and Louisiana, a range much broader than is covered by most of our Eastern plants. In New England and eastern Canada, where the introduced *C. officinale* often abounds, the indigenous species of *Cynoglossum* is very local, and it is only occasionally that one has an opportunity to study the native plant in the field. In July, 1905, however, while ascending with Messrs. E. F. Williams and J. F. Collins, the Little Cascapedia River in the County of Bonaventure, Quebec, I found a colony of the plant growing under larches in dry sandy alluvium. The characteristic species of the alluvium, *Arnica mollis*, *Dryas Drummondii*, *Astragalus frigidus*, var. *americanus*, *Sisyrinchium montanum*, *Calamagrostis Scribneri*, etc., were all high-northern or Rocky Mountain species; and it was, therefore, surprising to find with them a plant supposed to extend to Florida and the lower Mississippi.

Later study of the plant from the Little Cascapedia shows that in many points it differs from the plant of the Southern and Middle States, though it is quite like that of adjacent Canada, northern New England and New York, the Great Lakes and the northern Rocky Mountains. The more southern plant, the true *Cynoglossum virginicum* of Linnaeus, possibly extends into western New England, and plants under that name have been reported from western Massachusetts and Connecticut. Mr. E. B. Chamberlain in his study of the New England *Boraginaceae*,[1] however, was unable to verify the reports and the most northern material at hand comes from New Jersey and Pennsylvania. From there it extends southward, mostly in deciduous woods to the Gulf of Mexico, and west to Missouri and Texas. It is villous-hispid nearly to the inflorescence, and all but the very lowermost leaves are clasping. In anthesis its calyx is 3.5–4.5 mm. long; and its corolla 10 or 12 mm. broad, with suborbicular lobes and closed sinuses. The strongly echinate compressed orbicular-obovoid nutlets are cuneate at base, 7–9 mm. long.

[1] Rhodora, iii. 214.

In the northern plant, which usually occurs in coniferous woods, the slender peduncles are mostly appressed-pubescent, and the transition is more gradual than in *Cynoglosum virginicum* from the lower long-petioled to the upper amplexicaul leaves. The calyx in anthesis is 2–2.5 mm. long; the corolla 6–8 mm. broad, with ovate-oblong lobes and open sinuses; and the compressed pyriform-obovoid nutlets are 4–5 mm. long. This northern plant is of broad range in Canada and the Northern States, while the southern *Cynoglossum virginicum* is only doubtfully reported from southern New England. That the two are distinct species seems clear from the characters above enumerated, and the northern plant may be distinguished as

CYNOGLOSSUM **boreale**, sp. n. Planta 4–8 dm. alta; caule basi villoso-hispido, pedunculis elongatis (usque ad 1–2 dm. longis) appresso-pubescentibus; foliis radicalibus ellipticis vel lanceolato-ovalibus 1–3 dm. longis hispidis lamina petiolo fere aequanti, caulinis in petiolum brevem attenuatis vel subamplexicaulibus, superioribus oblongis 7–16 cm. longis basi auriculis rotundatis amplexicaulibus; racemis geminis 4–8-floris deinde 1–2 dm. longis; pedicellis fructiferis patente recurvis infimis 1.5–3 cm. longis; calycibus appresso-pubescentibus 2–2.5 mm. longis, lobis ovato-lanceolatis; corollis 6–8 mm. latis, lobis ovato-oblongis; nuculis tumidis ovoideo-pyriformibus glochidiato-echinatis 4–5 mm. longis. — QUEBEC, beneath *Larix* in sandy alluvial woods, Little Cascapedia River, July 17, 1905 (*Williams, Collins & Fernald*): NEW BRUNSWICK, gorge of Aroostook River, July 17, 1902 (*Williams, Collins & Fernald*): MAINE, woods, Orono, June 17, 1873 (*F. Lamson-Scribner*), June 5, 1898 (*E. D. Merrill*); open woods, South Chesterville, June 23, 1902 (*L. O. Eaton*); Harrison (*A. P. Chute*): NEW HAMPSHIRE, Franconia, June 16, 1886, June 14, 1887 (*E. & C. E. Faxon*): VERMONT, Bristol, May 26, 1898, and woods near Lake Dunmore, Salisbury, June 2, 1898 (*E. Brainerd*): NEW YORK, Salamanca (*G. W. Clinton*): MICHIGAN, Sault Ste. Marie, June, 1831 (*Houghton*); Copper Harbor, August, 1885 (*O. A. Farwell*, no. 295): ONTARIO, sandy woods, Nipigon River, July 3, 1884 (*J. Macoun*): BRITISH COLUMBIA, Donald, Columbia Valley, July 3, 1885 (*J. Macoun*).

GRAY HERBARIUM.

A CONTRIBUTION TO THE DESMID FLORA OF NEW HAMPSHIRE.

Joseph A. Cushman.

(*Continued from page 119.*)

Euastrum Ehrenb.

E. crassum (Bréb.) Kütz. (*E. magnificum*, var. *crassioides* Hast.) Length 155–176 μ: breadth 78–90 μ: isthmus 25–28 μ: breadth of polar lobe 42–61 μ. North Woodstock! Pudding Pond, North Conway! Rochester (*Hastings*).

* Var. **pulchrum** var. nov. (Plate 64, fig. 1). Variety with four small central granules and an abundance of smaller granules arranged as in the figure, in form more like the typical form than like var. *scrobiculatum*. Length 155 μ: breadth 75 μ: isthmus 25 μ: breadth of polar lobe 46 μ. Pudding Pond, North Conway! (Herbarium Cushman no. 118).

Var. ornatum (Wood) Hansg. (*E. ornatum* Wood.) Length 175 μ: breadth 95 μ: isthmus 25 μ: breadth of polar lobes 56 μ. Pudding Pond, North Conway, frequent! Saco Lake (*Wood*).

E. multilobatum Wood. Length 130 μ: breadth 65 μ: isthmus 18 μ: breadth of polar lobe 21 μ. Intervale! Pudding Pond, North Conway! Saco Lake (*Wood*).

E. pinnatum Ralfs. Length 133 μ: breadth 72 μ: isthmus 17 μ: breadth of polar lobe 35 μ. North Woodstock, common!

* E. cuneatum Jenner. Length 102–140 μ: breadth 59–62 μ: isthmus 14–15 μ: breadth of polar lobe 28–33 μ. Mt. Moosilauke!

* Var. **granulatum** var. nov. Variety with the surface covered with fairly large granules. North Woodstock!

E. Wollei Lagerh. Length 170 μ: breadth 108 μ: isthmus 21 μ: breadth of polar lobe 60 μ. Surface granular. Pudding Pond, North Conway!

E. ansatum Ehrenb. (*E. Ralfsii* Wood.) White Mountains, (*Wood*).

* As in the preceding part of this paper, starred forms are new to the New England Flora.

E. DIDELTA (Turp.) Ralfs. Length 98–152 μ: breadth 56–75 μ: isthmus 15–19 μ: breadth of polar lobe 20–31 μ. Intervale! Pudding Pond, North Conway!

E. AMPULLACEUM Ralfs. Length 90–100 μ: breadth 56–59 μ: isthmus 13–17 μ: breadth of polar lobe 23–25 μ. Pudding Pond, North Conway, frequent!

* Forma SCROBICULATUM Nordst. Noone's Station! (H. C. no. 392).

E. VERRUCOSUM Ehrenb., var. REDUCTUM Nordst. Length 78 μ: breadth 65 μ: isthmus 16.5 μ: breadth of polar lobe, 32 μ. North Woodstock! (H. C. no. 187).

E. CIRCULARE Hass. Length 65 μ: breadth 43 μ: isthmus 12.5 μ: breadth of polar lobe 19 μ. Intervale!

Var. RALFSII Wood. Saco Lake (*Wood*).

E. GEMMATUM (Bréb.) Ralfs. Length 40 μ: breadth 31 μ: isthmus 8 μ: breadth of polar lobe 15 μ. Intervale. Meredith (Herbarium Johnson no. 369). Plymouth and Laconia (*Wests*).

E. HASTINGSII Wolle. Cocheco River (*Wolle*).

E. BINALE (Turp.) Ehrenb., var. ELOBATUM Lund. Length 25 μ: breadth 18.5–20 μ: isthmus 4.5–5 μ: breadth of polar lobe 10 μ. North Woodstock (H. C. no. 186)! Pudding Pond, North Conway!

* Var. INSULARE (Roy) Wittr. Length 28 μ: breadth 19 μ: isthmus 5 μ. Mt. Moosilauke (H. C. no. 80)!

E. ELEGANS (Bréb.) Kütz. White Mountains (*Wood*).

E. INERME Lund. Length 50–65 μ: breadth 34–42 μ: breadth of polar lobe 10–12 μ. Intervale! Noone's Station!

E. DENTICULATUM (Kirch.) Gay. Length 37 μ: breadth 27 μ: isthmus 6.4 μ: breadth of polar lobe 20 μ. Pudding Pond, North Conway (H. C. no. 123)!

* E. PYRAMIDATUM West. Length 23 μ: breadth 19 μ: isthmus 5 μ: breadth of polar lobe 14 μ. Pudding Pond, North Conway! (H. C. no. 123). The American specimens do not differ materially from the British ones.

E. EVOLUTUM (Nordst.) W. & G. S. West. var. INTEGRIUS W. & G. S. West (*E. spinosum* Wolle). Length 53–59 μ: breadth 35–36 μ: isthmus 8.5–9.5 μ: breadth of polar lobe 28–31 μ. Pudding Pond, North Conway! Intervale!

* E. PAPILIO Racib.? Length 56 μ: breadth 37 μ: isthmus 10 μ:

breadth of polar lobe 26 μ. North Woodstock (H. C. no. 190)! A single semi-cell was all that was seen of this species and it is therefore referred here with somewhat of a question. The finding of more material may show it to be a new species.

* E. CIASTONII Racib. Length 44 μ: breadth 26 μ: isthmus 5.5 μ: breadth of polar lobe 20 μ. Noone's Station (H. C. no. 394)! This species has been reported from Florida by the Wests.

E. FISSUM W. & G. S. West. var. ***Americanum** var. nov. (Plate 64, fig. 2). Length 44 μ: breadth 25 μ: isthmus 4.5–6 μ. Variety differing considerably in ornamentation from the typical having a rounded granule at each side of the polar incision, a ring of eight granules about the base of protuberance of each semi-cell and with double instead of single granulations at the base. Pudding Pond, North Conway (H. C. no. 129)! The species is new to U. S. having been described from Ceylon.

MICRASTERIAS Ag.

M. TORREYI Bail. Length 215 μ: breadth 310 μ: breadth of polar lobe 90 μ: isthmus 35 μ. Pudding Pond, North Conway, rare! Surface slightly roughened with minute granules.

M. RADIOSA Ag. Length 158 μ: breadth 148 μ: isthmus 21 μ: breadth of polar lobe 36 μ. Pudding Pond, North Conway!

Var. SWAINEI (Hastings) W. & G. S. West. Rochester (*Wolle*).

M. ROTATA (Grev.) Ralfs. Length 242 μ: breadth 226 μ: isthmus 27 μ: breadth of polar lobe 57 μ. Pudding Pond, North Conway!

M. DENTICULATA Bréb. Length 280–310 μ: breadth 240–300 μ: isthmus 30–42 μ: breadth of polar lobe 65–76 μ. Intervale! North Woodstock! Pudding Pond, North Conway! Hanover (*Edwards*).

M. FIMBRIATA Ralfs. Rochester (*Wolle*).

M. FURCATA Ag. Length 150–186 μ: breadth 124–150 μ: isthmus 22–23 μ: breadth of polar lobe 62–94 μ. Noone's Station, frequent!

* Var. SIMPLEX Wolle. Length 190 μ: breadth 186 μ: isthmus 18 μ. Pudding Pond, North Conway! Although it has been conclusively shown that this variety grades into the typical form, it is noteworthy that in this particular instance, the two forms were distinct in the localities given, and no traces of the other form seen in either case.

M. RINGENS Bail., var. SERRATULA Wolle. Laconia (*Wests*, H. J. nos. 650, 679)!

M. AMERICANA (Ehrenb.) Ralfs. Length 140 μ: breadth 125 μ: isthmus 28 μ: breadth of polar lobe 77 μ. North Woodstock!

Var. RECTA Wolle. Length 143 μ: breadth 121 μ: isthmus 28 μ: breadth of polar lobe 65 μ. North Woodstock (H. C. no. 179). Although this is of about the same size as the typical form the whole character of the end lobe is quite different.

M. MAHABULESHWARENSIS Hobson. Meredith, rare (*Johnson*).

M. NORDSTEDTIANA Wolle. Breadth 170 μ. Meredith, rare (*Johnson*).

M. CRENATA Bréb. Hanover (*Edwards*).

M. TRUNCATA (Corda) Bréb. Length 77–118 μ: breadth 82–105 μ: isthmus 21–24 μ: breadth of polar lobe 60–78 μ. Intervale! Pudding Pond, North Conway!

M. LATICEPS Nordst., forma MAJOR Nordst. Length 150 μ: breadth 198 μ: isthmus 31 μ. Pudding Pond, North Conway, rare!

M. PINNATIFIDA (Kütz.) Ralfs. Length 56–65 μ: breadth 68–72 μ: isthmus 9.5 μ: breadth of polar lobe 50 μ. Intervale! Pudding Pond, North Conway!

M. DEPAUPERATA Nordst., var. WOLLEI Cushman. Length 140 μ: breadth 130 μ: isthmus 25 μ: breadth of polar lobe 90 μ. Pudding Pond, North Conway, rare!

M. FOLIACEA Bail. Length 80–96 μ: breadth 80–85 μ: isthmus 14.5–15 μ: breadth of polar lobe 36–38 μ. Pudding Pond, North Conway, rare! Laconia, rather scarce in a pond on a stream flowing from Lake Winnepesauke (*Wests*, H. J. no. 665)!

M. MURICATA Bail. Length 160–180 μ: breadth 120–140 μ: isthmus 21–22 μ: breadth of polar lobe 120–140 μ. Pudding Pond, North Conway, rare!

* Forma **minor** forma nov. Length 123 μ: breadth 84 μ: isthmus 16 μ: breadth of polar lobe 84 μ. Intervale!

COSMARIUM (Corda) Lund.

C. CONNATUM Bréb. (*Calocylindrus connatus* Wolle, '92). Length 53–56 μ: breadth 40–45 μ: isthmus 37–42 μ. Pudding Pond, North Conway! Intervale!

C. PSEUDOCONNATUM Nordst. (*Calocylindrus pseudoconnatus*

Wolle, '92). Length 32 μ: breadth 22 μ: isthmus 20 μ. Intervale, frequent!

*C. Thwaitesii Ralfs. (*Calocylindrus Thwaitesii* Wolle, '92). Length 133 μ: breadth 50 μ: isthmus 40 μ. North Woodstock (H. C. no. 183)!

C. moniliforme (Turp.) Ralfs., forma elongata W. & G. S. West. Length 41 μ: breadth 11 μ: isthmus 7 μ. Laconia (H. J. no. 658).

C. viride (Corda) Josh. Length 48–49 μ: breadth 25–26 μ: isthmus 20 μ. Holderness (*Wests*).

C. globosum Bulnh., var.* subarctoum Lagerh. Length 13.5 μ: breadth 11 μ: isthmus 8 μ. Pudding Pond, North Conway (H. C. no. 129)! Variety new to the U. S.

C. contractum Kirch. Length 56 μ: breadth 40 μ: isthmus 12.5 μ. North Woodstock!

*C. obliquum Nordst., var. trigonum West. (Plate 64, fig. 4). Length 25 μ: breadth 19 μ: isthmus 10 μ. Mt. Moosilauke (H. C. no. 78)! Variety new to U. S.

C. Baileyi Wolle. Length 40 μ: breadth 45 μ: isthmus 15 μ. Squam Lake!

C. Regnesii Reinsch. Length 12 μ: breadth 12 μ: isthmus 5 μ: thickness 5 μ. Laconia (*Wests*).

C. exiguum Arch., forma* major Nordst. Length 37 μ: breadth 25 μ: isthmus 5 μ. Pudding Pond, North Conway! The typical form was reported by Wolle from Florida, the variety is new to U. S.

C. nitidulum DeNot. Length 28 μ: breadth 25 μ: isthmus 6 μ. Pudding Pond, North Conway!

C. pyramidatum Bréb. Length 78–100 μ: breadth 52–59 μ: isthmus 9–18 μ. North Woodstock! Noone's Station!

C. pseudopyramidatum Lund. Length 56 μ: breadth 40 μ: isthmus 11 μ. Intervale!

* **C. claviferum** sp. nov. (Plate 64, fig. 3). C. of medium size nearly twice as long as wide, surface punctate, the side of each semi-cell with ten scattered granules arranged as in the figure; at the end are four granules arranged in a diamond form, below near the base are four more granules in a curve the two outer ones being larger than the inner two, at each side of the semi-cell are two other granules: ends of the semi-cells thickened, median region at the isthmus depressed. Length 44 μ: breadth 26 μ: isthmus 8.5 μ. Pudding Pond, North Conway!

C. PACHYDERMUM Lund., forma * MINOR Nordst. Length 73 μ: breadth 45 μ: isthmus 18.5 μ. Pudding Pond, North Conway!

C. PERFORATUM Lund. Length 61 μ! breadth 57 μ: isthmus 34 μ. Plymouth and Laconia (*Wests*).

C. CAPENSE DeToni. Length 76 μ: breadth 68–75 μ: isthmus 36 μ: Pudding Pond, North Conway!

C. TAXICHONDRUM Lund., forma BIDENTULUM Lagerh. Length, 40–42 μ: breadth 40–46 μ: isthmus 12–13 μ. Pudding Pond, North Conway! Intervale! Noone's Station!

C. SUBNUDICEPS W. & G. S. West. Length 44 μ: breadth 34 μ: isthmus 8 : thickness 16 μ. Laconia (*Wests*).

C. COSMETUM W. & G. S. West. Length 53 μ: breadth 43 μ: isthmus 13 μ: thickness 28 μ. Laconia (*Wests*, H. J. no. 672)!

C. QUINARIUM Lund. Length 38–40 μ: breadth 34–37 μ: isthmus 8–10 μ. Pudding Pond, North Conway! Intervale! Mt. Moosilauke!

C. TRIPLICATUM Wolle. Length 53 μ: breadth 39 μ: isthmus 12.4 μ. Holderness (H. J. no. 375)! and Plymouth (*Wests*).

C. POLYMORPHUM Nordst. Length 40 μ: breadth 31 μ: isthmus 7 μ. Intervale!

C. RACIBORSKII Lagerh. Length 44–48 μ.: breadth 50–53 μ: isthmus 20–21 μ. Meredith, very rare (*Johnson*): Laconia, occasional (*Wests*).

C. BOECKII Wille. Length 28 μ: breadth 30: isthmus 7 μ. Squam Lake!

C. TETROPTHALMUN (Kütz) Menegh. Length 57–81 μ: breadth 53–60 μ: isthmus 14–22 μ. Intervale! Pudding Pond, North Conway, common!

C. MARGARITATUM (Lund.) Roy & Biss. Length 90 μ: breadth 72 μ. Meredith, rare (*Johnson*).

C. PSEUDOORBICULARE Cushman. Length 29–32 μ: breadth 21–24 μ: isthmus 8 μ. Intervale! Squam Lake!

C. INTERMEDIUM Delp. Length 62 μ: breadth 53 μ: isthmus 21 μ: thickness 33 μ. North Woodstock!

* C. FAVUM W. & G. S. West. Length 70 μ: breadth 60 μ: isthmus 21 μ. Pudding Pond, North Conway! Slightly larger than the measurements of the type. As this species was described simply as North American this is its first definitely recorded locality.

C. DENTATUM Wolle. Length 125 μ: breadth 102 μ: isthmus 25μ. Squam Lake!

C. LATUM Bréb. Meredith (*Wests*).

C. RENIFORME Arch., var. COMPRESSUM Nordst. Length 55 μ: breadth 53 μ: isthmus 17 μ: thickness 27 μ. Laconia (*Wests*, H. J. no. 661)!

C. OCTHODES Nordst. Length 69 μ: breadth 56 μ: isthmus 15 μ. Intervale!

* C. QUADRUM Lund., forma **Johnsoni** forma nov. (*C. quadrum* Lund, forma. Johnson, Bull. Torr. Bot. Club., v. 22, 1895 (July) p. 294, Pl. 240, f. 22). Length 44 μ: breadth 40 μ: isthmus 14 μ. Plymouth (H. J. no. 359).

* C. GRANDIFORME Schmidle, var. **Americana** var. nov. (Plate 64, fig. 5). Length 53 μ: breadth 35 μ: isthmus 18 μ. This variety is considerably smaller than the typical, in other points not varying greatly. Species new to U. S. Pudding Pond, North Conway!

C. SUBORBICULARE Wood. (*C. isthmochondrum* Nordst.) Length, 31 μ: breadth 28 μ: isthmus 5 μ. Pudding Pond. North Conway! Saco Lake (*Wood*). As it seems certain that both of the above names represent a single species the older name of Wood should be retained.

C. CYCLICUM Lund. Meredith (*Johnson*).

C. AMOENUM Bréb., var. TUMIDUM Wolle. Length 40–47 μ: breadth 22–25 μ: isthmus 12 μ. Pudding Pond, North Conway! North Woodstock!

* C. HOMALODERMUM Nordst. Length 43 μ: breadth 37 μ: isthmus 7 μ. Intervale!

C. PHASEOLUS Bréb., var. ELEVATUM Nordst. Length 41 μ: breadth 25 μ: isthmus 5 μ. Var. new to U. S. Pudding Pond, North Conway!

C. RECTANGULARE Grun. Length 38 μ: breadth 30 μ: isthmus 10 μ: thickness 18 μ. Laconia occasional (*Wests*).

C. PYGMAEUM Arch., var. SCHLIEPHACKEANUM (Bréb.) W. & G. S. West. (*C. Schliephackeanum* Wolle, '92). Laconia occasional (*Wests*).

C. SINOSTEGOS Schaarschm., var. OBTUSIUS Gutw. Length 10 μ: breadth 8 μ: isthmus 3 μ: thickness 4 μ. Laconia, occasional (*Wests*).

C. ORNATUM Ralfs. Length 26–32 μ: breadth 27–34 μ: isthmus 8–10 μ. Pudding Pond, North Conway! Intervale! Squam Lake! Noone's Station!

C. ELOISEANUM Wolle. Length 105 μ: breadth 72 μ: isthmus 34 μ. Laconia, scarce (*Wests*, H. J. no. 641)!

* Var. DEPRESSUM W. & G. S. West. Length 92 μ: breadth without teeth 67 μ: with teeth 75 μ: isthmus 22 μ. A trifle larger than the measurements given by the authors. Pudding Pond, North Conway, frequent!

C. CAELATUM Ralfs, var.* **abnormale** var. nov. (Plate 64, figs. 6 and 7). Length 38–41 μ: breadth 37–38 isthmus 13–14 μ. The ends of the semi-cells are broadly truncate with five protuberances or lobes along the border each of these with two papillæ: at the side of each semicell is a large broadly rounded lobe as is usually seen in the typical species. Occasionally in the material there were specimens which showed the connection with the typical, but these were few and the variety on the other hand was abundant. North Woodstock (H. C. no. 187)!

C. BLYTTII Wille. Length 12 μ: breadth 12 μ: isthmus 3 μ. Squam Lake!

C. IMPRESSULUM Elfv. Length 25 μ: breadth 19 μ: isthmus 3.5 μ. Pudding Pond, North Conway!

C. PSEUDOPECTINOIDES Wolle. White Mountains (*Wolle*).

C. DISPERSUM Johnson. Length 40 μ: breadth 40–44 μ: isthmus 11 μ: thickness 20 μ. Meredith (*Johnson*).

PLEUROTAENIOPSIS Lund.

P. CUCUMIS (Corda) Lund. (*Cosmarium cucumis* Wolle, '92). Length 59–72 μ: breadth 34–43 μ: isthmus 15–17 μ. Pudding Pond, North Conway, frequent! Saco Lake (*Wood*).

P. DEBARYI (Arch.) Lund. (*Calocylindrus DeBaryi* Wolle '92). Length 75 μ: breadth 37 μ: isthmus 25 μ. Pudding Pond, North Conway!

* P. ELEGANTISSIMUM Lund. (*Cosmarium elegantissimum* Wolle '92), var. **simplicius** (W. & G. S. West) n. comb. Length 47 μ: breadth 22 μ: isthmus 19 . Intervale (H. C. no. 159)! The type of the variety was from Florida.

P. OVALE (Ralfs) Lund. (*Cosmarium ovale* Wolle '92), var. * **Westii** var. nov. The form mentioned by the Wests ('96) p. 249 as a common American form. It has a slightly subtruncate and

retuse apex, with the retuse portion without granules. Length 154–170 μ: breadth 86–93 μ: isthmus 30–36 μ. Pudding Pond, North Conway, scarce!

Xanthidium Ehrenb.

X. armatum (Bréb.) Rab. North Woodstock!

Var. cervicornis W. &. G. S. West. Length with spines 166 μ: without spines 130 μ: breadth with spines 125 μ: without spines 90 μ: isthmus 31 μ. Pudding Pond, North Conway! Saco Lake (*Wood*). There was no central group of granules as is frequently found in this species.

X. cristatum Bréb. Length with spines 75 μ: breadth with spines 50 μ: isthmus 14 μ. Pudding Pond, North Conway! Noone's Station!

Var. uncinatum Bréb. Length with spines 80 μ: without 59 μ: breadth with spines 56 μ: without 40 μ: isthmus 11 μ. Pudding Pond, North Conway!

* Forma angulatum West. Length with spines 72 μ, without 54 μ: breadth with spines 60 μ: without 40 μ: isthmus 11 μ. No central protuberance present. Pudding Pond, North Conway!

X. antilopaeum (Bréb.) Kütz. Length with spines 105 μ, without 71 μ: breadth with spines 102 μ, without 59 μ: isthmus 16 μ. Pudding Pond, North Conway!

Var. polymazum Nordst. Length with spines 62–84 μ, without 46–68 μ: breadth with spines 58–63 μ, without 45–62 μ: isthmus 14–16 μ. Pudding Pond, North Conway, frequent! Intervale! North Woodstock!

There is a considerable amount of variation even in this variety. Specimens from North Conway and Intervale have the long outwardly curved spines, and there are almost invariably but six granules in the chain. A considerably different form was met with from North Woodstock. This is like the specimen figured by L. N. Johnson under the variety *Minneapoliense* with the exception of the central spine. His specimen had the central spine above the chain of granules. That form was called var. *Johnsoni* by W. & G. S. West in a later paper, although Johnson calls attention to the extreme variability of this form. The present form lacks the spine of *Minneapoliense* but has the median lateral spine as well marked as the two adjacent

ones. In this character the present specimen is exactly like that figured by Johnson. Nordstedt also figures this peculiarity in var. *polymazum* but it is in his specimens much less marked.

* Forma **curvispinum** forma nov. (Plate 64, fig. 11). Length with spines 93 μ: without 56 μ: breadth with spines 108 μ, without 50 μ: isthmus 13.5 μ. Membrane punctate: the spines at the end start straight then curve outward making a decided angle. Pudding Pond, North Conway, common!

* Forma **callosum** forma nov. (Plate 64, fig. 12). Length with spines 84 μ, without 58 μ: breadth with spines 74 μ, without 44 μ: thickness 25 μ: isthmus 13 μ. There is a thickened spot at the center of each semicell. Pudding Pond, North Conway, frequent!

X. Tylerianum West. (*X. antilopaeum*, var. *truncatum* Wolle). Rochester, (*Wolle, Hastings*).

X. controversum W. & G. S. West. Length with spines 55–59 μ, without 36.5–38 μ: breadth with spines 52–56 μ, without 31 μ: isthmus 7.6–8 μ: thickness 20–21 μ. Laconia (*Wests*).

* X. Bengalicum Turner. (Plate 64, fig. 10). Length with spines 90 μ, without 68 μ: breadth with spines 108 μ, without 62 μ: isthmus 22 μ: length of spines 20 μ. Near the upper end of each semicell is a row of 15–20 small granules. Squam Lake! New to U. S.

* X. tetracentrotum Wolle. (Plate 64, figs. 8 & 9.) Length 37 μ: breadth with spines 53–57 μ, without 32–34 μ: isthmus 9.5 μ. Intervale! Pudding Pond, North Conway! There is a great variation in the number and arrangement of the granules in this species. In the specimen from Intervale, fig. 9, there are indications of two distal spines one on each semicell.

Arthrodesmus Ehrenb.

A. convergens Ehrenb. Length 33–40 μ: breadth with spines 45–50 μ, without 34–35 μ: isthmus 8 μ. Intervale!

A. quadridens Wood. Length 35 μ: breadth with spines 50 μ: without 35 μ: isthmus 8 μ. Pudding Pond, North Conway!

A. Incus (Bréb.) Hass. var. * longispinus Eichl. & Racib. Length with spines 42 μ, without 14 μ: breadth with spines 38 μ, without 14 μ: isthmus 6.5 μ: length of spine 20 μ. Pudding Pond, North Conway!

* Var. validus W. & G. S. West. Length with spines 68–71 μ,

without 34–36 μ: breadth with spines 75–77 μ, without 36–43 μ: isthmus 7–8 μ: length of spine 25–27 μ. Spines shorter than the typical form. Pudding Pond, North Conway!

*Var. RALFSII W. & G. S. West. Length 25 μ: breadth with spines 59 μ, without 19 μ: isthmus 6.2 μ. Pudding Pond, North Conway (H. C. no. 164)! Squam Lake!

A. OCTOCORNIS Ehrenb. Length with spines 46 μ, without 14 μ: breadth with spines 44 μ, without 22 μ: isthmus 6 μ. Pudding Pond, North Conway!

* Forma MINOR Jacobs. Length with spines 21 μ, without 14 μ: breadth with spines 18 μ: isthmus 3 μ. Intervale! Var. new to U. S.

A. TRIANGULARIS Lagerh., var. INFLATUS W. & G. S. West. Length 38–40 μ: breadth with spines 68–72 μ: without 21–25 μ: isthmus 6.5–7 μ. Pudding Pond, North Conway, frequent! Laconia (*Wests*, H. J. no. 659).

STAURASTRUM Meyen.

S. ANCHORA W. & G. S. West. Length 76 μ: breadth 140 μ. Laconia, (*Wests*, H. J. no. 657).

S. ARACHNE Ralfs. Length 42 μ: breadth with processes 52 μ: isthmus 16 μ. Noone's Station! Saco Lake (*Wood*).

S. ARCTISCON (Ehrenb.) Lund. (*S. munitum* Wood.) Length with processes 150–155 μ, without 72–96 μ: breadth with spines 142–160 μ, without 62–68 μ: isthmus 31–33 μ. Wolle's figures of this species are not at all good. The figures of Wood are much more nearly correct. In their paper "On Some North American Desmidieae" (Trans. Linn. Soc. Lond. Ser. II. (Bot.) vol. v. pt. 5, p. 269) the Wests give the following: "All American examples we have seen of this species have shorter processes than the European ones, and they have at most but three rings of small teeth on each process." While this has been found true in Massachusetts specimens and some of those from New Hampshire it does not always hold true. The specimens from Pudding Pond, North Conway have long processes which are bifurcate at the apices as figured by Wood and have six or more rings of teeth on each process. Pudding Pond, North Conway! Squam Lake! Meredith, Holderness (*Wests*).

*S. ARCUATUM Nordst., forma ACICULIFERA W. & G. S. West. Length with processes 26–27 μ, without 19 μ: breadth with proc-

esses 32–48.5 μ, isthmus 7.5–9.5 μ. Intervale! This variety is described simply as North American by the authors so that this record is the first with a definite locality. The specimens are in every way like the type of the variety except for slight variations in measurements.

* S. BOTROPHILUM Wolle. Length 46–50 μ: breadth 34–40 μ: isthmus 9.5–11 μ. North Woodstock, common!

S. BRASILIENSE Nordst. Length with spines 133 μ, without 75 μ: breadth with spines 120 μ, without 63 μ: isthmus 33 μ. Pudding Pond, North Conway! One specimen was noted which was five armed in end view.

S. CERASTES Lund. Length 56 μ: breadth with processes 46 μ: isthmus 11 μ. Pudding Pond, North Conway (H. C. no. 122)! This agrees in every way with the original figures of Lundell.

* S. CLAVIFERUM W. & G. S. West. Length 36 μ: breadth with processes 42 μ, without 34 μ: isthmus 12 μ. Squam Lake! This again gives a definite locality for a species recorded simply as North American.

* S. CONCINNUM W. & G. S. West. (*S. forficulatum* Wolle '92.) Length 45 μ: breadth 72 μ: isthmus 12 μ. Intervale!

* S. CORNIGERUM Roy & Biss. Length 38 μ: breadth with spines 41 μ: isthmus 10 μ. Pudding Pond, North Conway (H. C. no. 151)! Intervale! New to U. S.

S. ECHINATUM Bréb. Length 42 μ: breadth 34 μ. Pudding Pond, North Conway!

S. FORFICULATUM Lund., var. ENOPLON West. (*S. crescentum* Hastings) Dover (*Wolle*).

S. GRACILE Ralfs. Breadth with processes 50–62 μ: isthmus 10.5 μ. Pudding Pond, North Conway!

S. GRANDE Bulnh. Length 70 μ: breadth 65 μ: isthmus 15 μ. Intervale! Meredith (*Johnson*).

S. JOHNSONII W. & G. S. West. Length 45–56 μ: breadth with processes 82–102 μ: breadth at base 14–18 μ: isthmus 8–9 μ. Intervale, common! Meredith, Holderness, Laconia (*Wests*).

S. LACONIENSE W. & G. S. West. Length 31 μ: breadth with spines 48–53 μ: without 38 μ: isthmus 12 μ. Pudding Pond, North Conway! Laconia (*Wests*).

S. LEPTACANTHUM Nordst. Length with processes 84 μ, without 34 μ: breadth with processes 65 μ, without 22 μ: isthmus 11 μ. Pud-

ding Pond, North Conway! This was the typical form, that called by Lagerheim 6 + 4 radiata.

S. LEPTOCLADUM Nordst. Length with processes 74–80 μ, without 30 μ: breadth with processes 96–112 μ: isthmus 11 μ. Pudding Pond, North Conway!

S. LEWISII Wood. Breadth with processes 62 μ: without 34 μ: isthmus 5.5–6 μ. Pudding Pond, North Conway (H. C. no. 136)! Saco Lake (*Wood*). This has the basal spines, the absence of which seems to be the only difference between it and *S. aristiferum* Ralfs. var. *parallelum* W. &. G. S. West.

* S. LONGIRADIATUM W. & G. S. West, forma MAJOR W. &. G. S. West. Length with processes 62–68 μ, without 31 μ: breadth with processes 80–90 μ, isthmus 10 μ. Pudding Pond, North Conway (H. C. no. 151)! This had more curved processes than the specimen figured by the authors but was in essential points the same. It had the three spines at the end of the processes which is characteristic of the form. This again gives a definite locality for a species described simply as North American.

* S. LONGISPINUM (Bail.) Arch., var. **bidentatum** (Wittr.) n. comb. (Plate 64, fig. 13.) (*S. bidentatum* Wittr.) Length 103 μ: breadth with spines 125–155 μ, without 90–92 μ: isthmus 33 μ: length of spine 29 μ. Squam Lake! Pudding Pond, North Conway, occasional! The form with two spines at each angle and these short and fairly stout instead of long as in the typical.

* S. LUNATUM Ralfs. Length with spines 40 μ, without 30 μ: breadth with spines 40–44 μ, without 28–32 μ: isthmus 6.5 μ. Pudding Pond, North Conway!

S. MACROCERUM Wolle. Length 58 μ: breadth with processes 125–127 μ: without 22–25 μ: isthmus 15 μ. Pudding Pond, North Conway, frequent!

S. MEGACANTHUM Lund. Length 46 μ: breadth with spines 83 μ. Pudding Pond, North Conway!

S. MEGALONOTUM Nordst. Length with spines 48 μ: breadth with spines 40 μ: isthmus 12.5 μ. Pudding Pond, North Conway (H. C. no. 131)!

Forma OBTUSUM Hast. Rochester (*Hastings*).

* S. MINUTISSIMUM Reinsch., var. CONSTRICTUM West. Length 24 μ: breadth 24 μ: isthmus 9 μ. Squam Lake!

S. MUTICUM Bréb. Length 36 μ: breadth 36 μ. Squam Lake!

S. Ophiura Lund., var. *tetracerum Wolle. Length 60 μ: breadth with processes 108 μ: without 24 μ: isthmus 15 μ. Pudding Pond, North Conway, frequent!

S. paradoxum Meyen. Breadth 45 μ. Squam Lake! Saco Lake (*Wood*).

S. pentacladum Wolle. Length 38 μ: breadth with processes 47–52 μ: without 13–25 μ: isthmus 8–16 μ. Intervale! Noone's Station!

*S. **pulcherrimum** sp. nov. (Plate 64, fig. 14). Length with spines 100 μ, without 80 μ: breadth with spines 78 μ, without 46 μ: isthmus 15.5 μ. In front view semicells compressed spherical, in end view quadrangular with the sides tumid, each angle with two large spines confluent at the base, sides with four vertical rows of paired granules arranged in fours. Pudding Pond, North Conway (H. C. no. 131)!

S. saltans Josh., var. forcipigerum Lagerh. (Plate 64, fig. 15.) Length without spines 65 μ: breadth with processes 118 μ: breadth at base 12.5 μ: isthmus 7 μ. Pudding Pond, North Conway, frequent!

S. spongiosum Bréb. Length with processes 65 μ, without 53 μ: breadth with processes 53 μ: isthmus 15 μ. Pudding Pond, North Conway (H. C. no. 129)!

*Var. depauperatum Racib. Length 41 μ: breadth 28 μ: isthmus 8 μ. Pudding Pond, North Conway (H. C. no. 129)!

S. striolatum Näg. Breadth 34 μ: isthmus 10 μ. North Woodstock!

Forma Brasiliense Turner. Length 25 μ: breadth 22 μ: isthmus 7 μ. Laconia (*Wests*, H. J. no. 676).

S. sublaevispinum Wests. Length 25 μ: breadth 37 μ: isthmus 7 μ. Laconia (*Wests*, H. J. no. 651)!

Sphaerozosma Corda.

S. excavatum Ralfs, forma laevis Rab. Length 12–12.5 μ: breadth of filament 12 μ: isthmus 4.5 μ. Pudding Pond, North Conway, frequent!

Forma granulata Rab. (*S. spinulosum* Wolle,? '92). Length 9–10 μ: breadth of filament 9 μ: isthmus 3.2 μ. Pudding Pond, North Conway! Intervale!

Onychonema Wallich.

*O. Nordstedtiana Turner. Length 12.5 μ: breadth 12.5 μ: isthmus 3.5 μ: thickness 6.4 μ. Filament twisted, from one face to the next face 24 cells, complete double turn 48 cells. Intervale!

O. laeve Nordst., var. micracanthum Nordst. Length 14 μ: breadth with processes 21 μ, without 16 μ: isthmus 3.5 μ. Intervale!

Spondylosium Bréb.

S. pulchrum (Bail.) Arch., var. inflatum (Wolle) W. & G. S. West. (*Sphaerozosma pulchrum*, var. *inflatum* Wolle '92). Length 33 μ: breadth of filament 65 μ: isthmus 10 μ. Pudding Pond, North Conway (H. C. no. 138)! Laconia (*Wests*, H. J. no. 667)!

S. moniliforme Lund. (*Sphaerozosma moniliforme* Wolle '92). Length 34 μ: breadth 17 μ. Laconia (*Wests*, H. J. no. 680)!

Hyalotheca Ehrenb.

H. dissiliens (Smith) Bréb. Length 22 μ: breadth of filament 25–28 μ. Pudding Pond, North Conway! North Woodstock!

*Var. minor Delp. Length 12–15 μ: breadth of filament 18–22 μ. Intervale!

Desmidium Ag.

D. aptogonum Bréb. Length 12 μ: breadth of filament 21–34 μ: isthmus 14 μ. Pudding Pond, North Conway, frequent! Intervale!

D. Baileyi (Ralfs) Nordst. Length 20–25 μ: breadth of filament 21–25 μ. Pudding Pond, North Conway! Intervale!

D. Swartzii Ag. Length 12 μ: breadth of filament 37–43 μ. Pudding Pond, North Conway! Intervale!

* D. coarctatum Nordst. Length 28–40 μ: breadth of filament, maximum 38–45 μ, minimum 25–33 μ. Pudding Pond, North Conway, common!

D. quadratum Nordst. Length 22 μ: breadth of filament 36–40 μ. Intervale! Noone's Station!

D. graciliceps (Nordst.) Lagerh. Pudding Pond, North Conway!

D. cylindricum Grev. Maximum breadth 46 μ, minimum 31 μ. Pudding Pond, North Conway!

Gymnozyga Ehrenb.

G. moniliformis Ehrenb. (*Bambusina Brebissonii* Wolle '92). Length 25–37 μ: maximum breadth 18–25 μ, minimum 16–21 μ. Pudding Pond, North Conway! Intervale!

Altogether in the two parts of the present paper there are reported two hundred and fifty-three species and varieties of Desmids. Hitherto there were but seventy-four reported from the State, so that one hundred and seventy-nine are new records for the State. A considerable number of the species or varieties were also new to the New England list. One thing is very noticeable and that is the confirmation of the fact that a granitic country or one with old geological rocks will give a much greater number of species than one of opposite character. In the collection from Pudding Pond, North Conway, in spite of the fact that but one collection was made at only one time of year there have been identified one hundred and twenty-six species and varieties, exactly one half of the whole number reported from all sources from the State. This number might be increased by a continued examination of the Pond at other seasons and at other parts. Altogether from the small amount of ground covered there is every indication that the State of New Hampshire will furnish a large part of the Desmids that will be reported from New England.

Boston Society of Natural History.

Explanation of Plate 64.

Figures 4, 10–13, × 400: all others × 550.

Figure 1. *Euastrum crassum* (Bréb.) Kütz., var. *pulchrum* var. nov.
" 2. *Euastrum fissum* W. & G. S. West, var. *Americanum* var. nov.
" 3. *Cosmarium claviferum* sp. nov.
" 4. *Cosmarium obliquum* Nordst., var. *trigonum* West.
" 5. *Cosmarium grandiforme* Schmidle, var. *Americanum* var. nov.
" 6, 7. *Cosmarium caelatum* Ralfs, var. *abnormale* var. nov. Fig. 7 shows connection with the typical form of the species.
" 8, 9. *Xanthidium tetracentrotum* Wolle.
" 10. *Xanthidium Bengalicum* Turner.
" 11. *Xanthidium antilopaeum* (Bréb.) Kütz., forma *curvispinum* forma nov.
" 12. *Xanthidium antilopaeum* (Bréb.) Kütz., forma *callosum* forma nov.
" 13. *Staurastrum longispinum* (Bail.) Arch., var. *bidentatum* (Wittr.).
" 14. *Staurastrum pulcherrimum* sp. nov.
" 15. *Staurastrum saltans* Josh., var. *forcipigerum* Lagerh.

Draba borealis in Eastern America. — In the discussion of the plants which in eastern America have passed as *Draba incana* Mr. Knowlton and I referred[1] briefly to a species of the Behring Sea region, *D. borealis* DC., which has been known only from northwestern America and adjacent Asia. While exploring the bleak exposed shores of Cap Enragé, outside the harbor of Bic on the lower St. Lawrence, Mr. J. F. Collins and I were greatly pleased, therefore, to find in July last very characteristic specimens of this Alaskan species. The plants, large and finely developed, were growing in the shade of boulders at the base of the precipitous sea-wall, but they had been so freely nibbled by the nesting gulls that it was impossible to secure much perfect material. Such plants as were collected are beautifully matched by specimens from Unalaska, Behring Island, and shores of the Ochotsk Sea.

Draba borealis is very quickly distinguished from the local *D. megasperma*, to which it is nearest related, by its larger more numerous leaves, very loose elongate pubescence, and by the longer-pedicelled siliques which are oblong-lanceolate, strongly twisted, and, including the prominent styles (1 mm. or more long), in maturity becoming 1.5 to 1.8 cm. long. — M. L. Fernald, Gray Herbarium.

The Fern Allies.[2] — Mr. Clute's recently issued work on the fern allies is similar in character to his "Our Ferns in their Haunts." By devoting a whole volume to a restricted group of plants the author has been able to give considerable space to each species and thus state at length and in popular language facts concerning the habits and habitats, which have ordinarily been compressed into a few terse and technical expressions. It is well known that species and varieties in the fern allies are somewhat vague in their natural limitation and consequently subject to widely different interpretation. The author has wisely refrained from excessive splitting and has evidently endeavored to make his nomenclature conservative. He has not, however, been able to refrain from framing a few new and, at least in some cases, quite needless combinations, as for instance

[1] Rhodora, vii. 65.

[2] The Fern Allies of North America North of Mexico by Willard Nelson Clute, with illustrations by Ida Martin Clute; 8vo, xiv, and 278 pp.; F. A. Stokes Co., New York.

his *Lycopodium Selago lucidulum*, a name which will scarcely be maintained by any careful observer or trained systematist and which even the author himself discards before he reaches his checklist of species at the end of the volume. The littering of botanical synonymy with such useless names seems to us more reprehensible than any bone fide attempt no matter how radical to reform nomenclature. It may be properly urged furthermore that the launching of new names or combinations should not be attempted unless their exact relation to earlier names is made clear by adequate and orderly bibliographical references to previous literature. If it should be held that such definite and scholarly citation is out of place in a manual primarily intended for beginners, it is no less clear that such popular works are not the medium for the publication of new scientific names. In the checklist the name *Robbinsii* is spelled *Robinsii*, and *porophilum* is spelled *porophylum*. A brief glossary is appended in which some of the definitions such as "Tomentose. — Covered with matted wool," "Panicle. — A cluster of fruit in which the stems branch more or less," and "Spatulate. — Spoon-shaped," might have been considerably improved.

The pen illustrations which are numerous and sufficiently characteristic will doubtless be useful to the beginner. Some colored process plates are less successful, exhibiting in distorted perspective certain species, which stand out in front of their scenic background in a way strongly suggestive of their majestic allies of the carboniferous period.

Notwithstanding some defects the book is a worthy addition to popular botanical literature and will doubtless aid many in the study of an interesting group of plants. — B. L. R.

The Tenth Anniversary of the Founding of the New England Botanical Club. — On December 1st, the New England Botanical Club held its annual meeting at Hotel Brunswick, in Boston. At the business session the customary reports of the treasurer and curators were presented, several new members were voted into the Club, and the following officers were elected for the coming year: *President*, B. L. Robinson, *Vice-President*, Walter Deane, *Recording Secretary and Treasurer*, E. F. Williams, *Corresponding Secretary*, E. L. Rand, *Phanerogamic Curator*, M. L. Fernald, *Cryptogamic Curator*, Hollis Webster, *Councillors*, Messrs. G. G. Kennedy, F. S. Collins, and F. D. Lambert.

The business session was followed by a dinner in celebration of the tenth anniversary of the founding of the Club. The retiring president, Mr. F. S. Collins, presided and acted as toast master. Mr. Williams, who for the whole ten years has served as the recording secretary and treasurer of the Club, gave an admirable sketch of its history, specially emphasizing the value of such an organization in stimulating and co-ordinating the activities of the amateur botanists of the region. On motion of Mr. Rand, it was unanimously voted that this historical sketch should be printed for distribution to all members of the Club. The other speakers were Messrs. Farlow, the first president of the Club, Robinson, Fernald, Webster, Deane, and Brainerd, whose addresses felicitously recalled many of the more humorous as well as the serious aspects of the work in which the Club has been engaged during the past decade. The dinner was attended by nearly fifty resident and non-resident members, who had gathered from New York, New Brunswick, and every state of New England except New Hampshire. The evening will long be remembered as one of the pleasantest in history of the Club.

The Death of Francis Howard Peabody. — It is with deep regret that we record the death on September 22nd, 1905, of Francis Howard Peabody. As senior member of one of the most prominent and successful banking firms in New England, Mr. Peabody was subject to the constant and pressing demands of his influential position. It is, therefore, one of the best evidences of his breadth of interests and largeness of character that he found time and attention for literary and scientific pursuits. As a pupil and for many years thereafter a warm personal friend of Dr. Asa Gray, Mr. Peabody had a very cordial interest in botanical investigation, and for several years served as chairman of the Visiting Committee of the Gray Herbarium. He became a member of the New England Botanical Club June 4th, 1897, and gave much cordial encouragement as well as financial aid to its various undertakings. Although he would have been the last to claim much technical knowledge of botany, his well trained judgment and keen discrimination gave him a surprising insight into the ideals and problems of modern botanical research. Mr. Peabody died suddenly of heart-disease at his summer home in Beverley, Massachusetts. He was in his seventy-fourth year.

ERRATA.

Page 7, line 53; for blue *read* violet.
" 36, " 29; " *Michx.* read Michx.
" 60, " 23; " persistentem *read* persistens.
" 60, " 31; " Vermont *read* VERMONT.
" 67, headline; " Darba *read* Draba.
" 113, line 10; " *Calocylindricus* read *Calocylindrus.*
" 114, " 11; " *Calocylindus* read *Calocylindrus.*
" 117, " 31; " GRANULATA read GRANULATUM.
" 123, " 32; " pepperedge *read* pepperidge.
" 142, " 30; " tenerifolia *read* tenuifolia.
" 142, " 30; " Enonymus *read* Euonymus.
" 145, " 23; " Jersey *read* York.
" 148, " 7; " *Sornborger* read Sornborger.
" 154, " 26; " *Stygius* read *stygius.*
" 154, " 27; " *Pingincula* read *Pinguicula.*
" 159, " 20; " MUNROA read MUNRÒA.
" 159, " 21; " LISTERA read LÍSTERA.
" 159, " 38; " ERIGENIA read ERIGENÌA.
" 160, " 7; " STENOSIPHON read STENOSÌPHON.
" 160, " 19; " LILIUM read LÌLIUM.
" 160, " 23; " MODIOLA read MODÍOLA.
" 160, " 27; " CHAMAELIRIUM read CHAMAELÌRIUM.
" 161, " 6; " SENECIO read SENÉCIO.
" 161, " 18; " PRIMULA read PRÌMULA.
" 161, " 19; " VACCINIUM read VACCÌNIUM.
" 167, " 2; " *racemosa* read *racemosus.*
" 186, " 15; " auguste *read* anguste.

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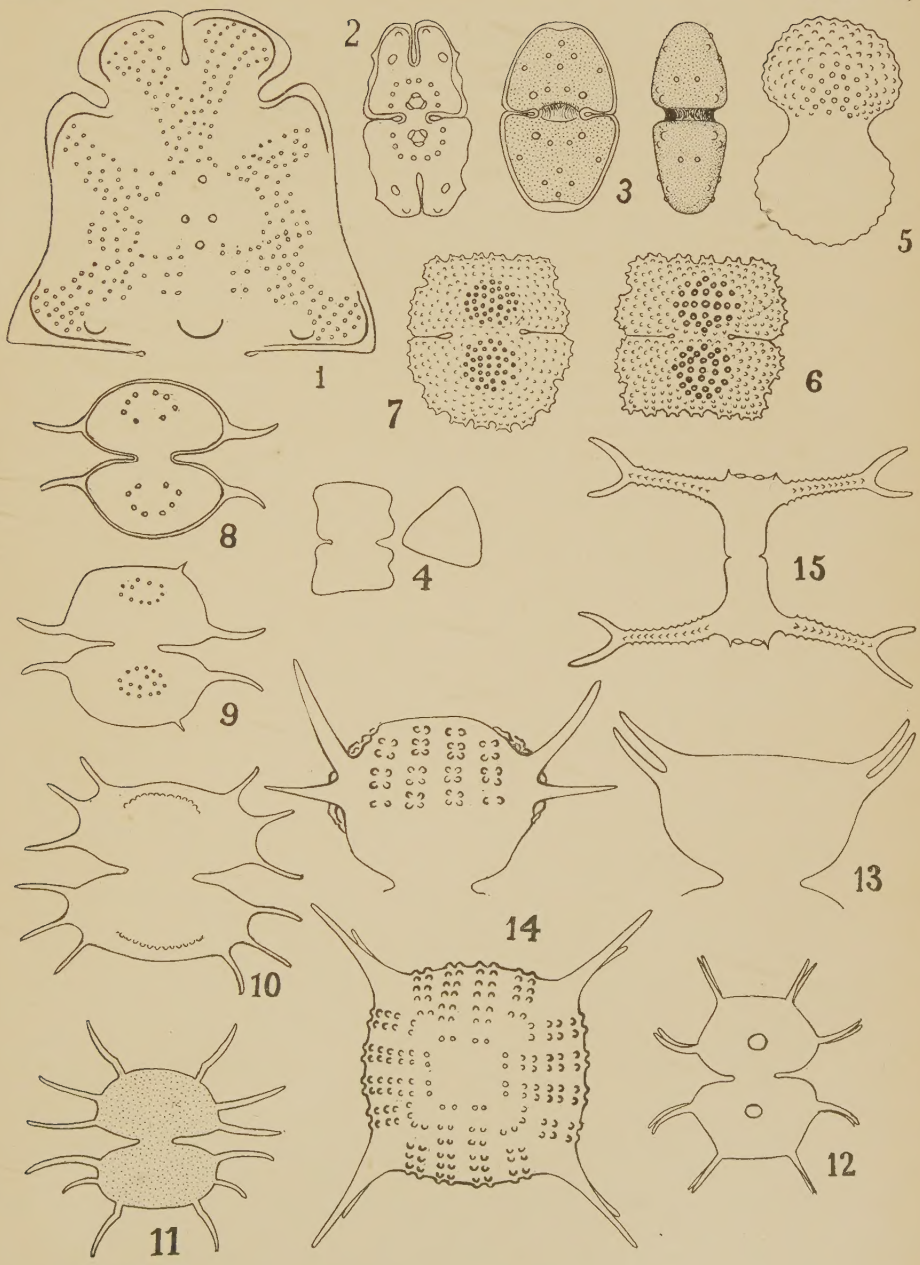

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